

REMARKS

This responds to the Office Action dated April 17, 2006. Claim 20 is amended. No claims are cancelled or added. As a result, claims 1-30 remain pending in this patent application.

Claim Objection

Claim 20 was objected to due to an informality. Applicant has amended the claim to overcome this objection. Accordingly, Applicant respectfully requests withdrawal of this basis of objection to this claim.

§103 Rejection of the Claims

1. Claims 1, 4-7 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over "Alvarez (U.S. Patent No. 6,166,524)." Applicant respectfully traverses.

As an initial note, Applicant respectfully submits that the quoted reference relied on as a basis of rejection (i.e., "Alvarez [6166524]) appears to be incorrect, since U.S. Patent 6,166,524 is issued to Takeuchi et al., and the portions of the reference cited in the Office Action, if applied to Takeuchi et al. '524 do not make sense. Accordingly, Applicant has researched and independently determined that, based on the contextual information in the Office Action, the Examiner appears to have intended to apply Alvarez U.S. Patent No. 6,167,349. Thus, Applicant is responding as though this basis of rejection relies on Alvarez U.S. Patent No. 6,167,349. If this is incorrect, Applicant respectfully requests notification of the same, and that Applicant's response with respect to Alvarez U.S. Patent No. 6,167,349 be stricken from the record. If Applicant's assumption is correct, Applicant would appreciate written confirmation of the same by the Examiner.

The Office Action states:

Alvarez does not disclose specifically determining the energy remaining in the cell. However, Alvarez discloses the method and system are used for evaluating battery in a battery backup or standby system where voltage measurements are taken across each jar in the group at various times during the application of the current load [see abstract]. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use Alvarez' method for determining the energy remaining in the cell since the examiner takes Official Notice of the equivalence of determining the status of the cell and determining the

energy remaining in the cell for their use in the energy storage art and the selection of any of these known equivalence to establish the energy remaining in the cell would be within the level of ordinary skill in the art. Inasmuch as the reference disclose these elements as art recognized equivalents, it would have been obvious to one of ordinary skill in the art to substitute one for the other.

(Office Action at 3.) Thus, the Office Action admits that Alvarez does not disclose determining the energy remaining in the cell from its measurement. Instead, the Office Action attempts to rely on Official Notice to overcome this deficiency of Alvarez. 4, 11, 12, 14 and 20 of U.S. Patent No. 6,963,776. Applicant respectfully, but strongly, disagrees, and requests that the Examiner provide either a reference or an affidavit in support of such assertion, as required by M.P.E.P. § 2144.03.

Applicant notes that Alvarez is very specific in intending to measure “the ohmic resistance, the charge transfer resistance and the double layer capacitance of each jar.” (Alvarez at Abstract). For example, Alvarez specifically states:

For lead-acid batteries, it is known in the art that some of the primary measures of battery jar health are the electrolyte resistance, the charge transfer resistance and the double layer capacitance. It is important that the electrolyte solution have the proper acid concentration, which is related to the amount of charge in the jar, and this can be determined by examining the resistance of the electrolyte, which should lie within a defined range.

(Alvarez at col. 1, lines 8 – 15.) Thus, to the extent that Alvarez’s measurement of electrolyte resistance, which is indirectly related to electrolyte concentration, which, in turn, is indirectly related to charge in the cell, it can only determine whether the electrolyte resistance lies “within a defined range.” This falls short of being able to actually determine the amount of energy remaining in the cell, as similarly recited or incorporated in the present claims. Moreover, Alvarez goes on to state:

However, the actual electrolyte resistance cannot be measured by itself, since it is only one component (albeit the major one) of the overall ohmic resistance of the jar, which also includes the resistance of the jar grids, terminals, and interconnections or straps. But since the electrolyte resistance is the largest part of the overall ohmic resistance in a properly maintained corrosion-free installation, examining the overall ohmic resistance can provide an indication of the specific gravity of the electrolyte solution. The charge transfer resistance is the resistance between the battery plate and the electrolyte solution, and is related to the condition of the interface between the plate and the electrolyte. Ideally, the charge transfer resistance is zero, but it is considered acceptable if it is below some

predetermined value. The plate/electrolyte interface can best be described as two rigid layers of ions which form what is referred to as a "Helmholtz double layer". With increasing plate sulphation and/or grid corrosion, there is less surface area for the inner layer of ions to adsorb to the plate and consequently fewer ions are present in the outer layer closest to the electrolyte. The resultant capacitance (also known as the "double layer capacitance") provides a measure of the plate surface area which is free of sulphation and/or corrosion, and measuring the decrease in capacitance over time provides an indication of the rate of the electrochemical deterioration of the jar. With increasing plate sulphation and/or corrosion, there is a corresponding increase in the charge transfer resistance as well.

It would therefore be desirable to be able to measure the ohmic resistance, the charge transfer resistance and the double layer capacitance of a battery jar, and to be able to do so while the battery jars are on-line in the backup or standby system.

(Alvarez at col. 1, lines 15-48.) Thus, Alvarez explicitly teaches that it is the electrolyte resistance that is related to battery charge, and that electrolyte resistance is the major component of ohmic resistance, and that the measurement of ohmic resistance is confounded by the charge transfer resistance and the double layer capacitance. This is illustrated by FIG. 3 of Alvarez which shows a component V1, defining the ohmic resistance, and a component V2, related to the charge transfer resistance and the double layer capacitance—which Alvarez apparently measures, but which Alvarez does not recognize as being related to battery charge, but which Alvarez attempts to use merely “to obtain a reliable measurement of the initial voltage drop V1.” (See Alvarez at col. 4, lines 36-37.) Clearly, Alvarez’s goal is to obtain a reliable measurement of V1, and measuring the component V2 is merely incidental to getting an accurate reading of V1.

However, Alvarez’s V1 represents a voltage drop between: (1) a time just prior to drawing a current pulse; and (2) a time just after drawing a current pulse. (See Alvarez at column 3, lines 53-67.) This is different from the present claims, which recited or incorporate measuring a voltage drop *during* a time period in which a substantially constant current pulse is being drawn. In sum, because Applicant cannot find in Alvarez any disclosure, teaching, or suggestion of measuring a voltage drop during a time period while a substantially constant current pulse is being drawn from a battery, and determining the energy remaining in the cell using the result of such measurement, Applicant respectfully submits that all elements recited or incorporated in claims 1, 4-7 and 30 are not disclosed, taught, or even suggested by Alvarez.

Accordingly, because no *prima facie* case of obviousness exists with respect to these claims, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

2. Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alvarez, as disclosed above, in view of Takeuchi et al. (U.S. Patent No. 6,166,524).

As an initial note, as discussed above Applicant again assumes that this rejection is based on Alvarez U.S. Patent No. 6,167,349. Thus, Applicant is responding as though this basis of rejection relies on Alvarez U.S. Patent No. 6,167,349. If this is incorrect, Applicant respectfully requests notification of the same, and that Applicant's response with respect to Alvarez U.S. Patent No. 6,167,349 be stricken from the record. If Applicant's assumption is correct, Applicant would appreciate written confirmation of the same by the Examiner.

Applicant respectfully traverses this rejection on the grounds that no *prima facie* case of obviousness exists with respect to claims 2-3, because for the reasons discussed above with respect to the § 103 rejection of claims 1, 4-7 and 30, no *prima facie* case of obviousness exists with respect to these claims because all elements incorporated into claims 2-3 are not disclosed taught or suggested by Alvarez (as discussed above), and such deficiencies do not appear to be cured by the addition of Takeuchi et al. Accordingly, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

Allowable Subject Matter

Applicant gratefully acknowledges the allowance of claims 13-29.

Claims 8-12 were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Nonetheless, in view of the above, Applicant respectfully submits that such claims are believed allowable in their present form. Accordingly, Applicant respectfully requests allowance of such claims.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6951 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

KRISTOFER J. JAMES ET AL.

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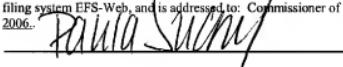
Date July 17, 2006

By 

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 17 day of June, 2006.


Name


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